

## Notes on the moth *Arsenura armida erythrinae* (F.)

by

J. B. M. VAN DINTHER

(*Entomologist, Agricultural Experiment Station, Paramaribo*)<sup>1)</sup>

Caterpillars of the moth *Arsenura armida erythrinae* (F.)<sup>2)</sup>, formerly known as *Rescynthis erythrinae* F., occur rather frequently on *Erythrina glauca* Willd. ("dadap", "immortelle", "madre de cacao"), a shade tree commonly used in cacao and coffee plantations in Suriname. Although the injury to the tree is as a rule negligible, the caterpillars attracted the attention of estate owners during January 1955 as the animals seriously attacked young cacao trees grown under *Erythrina glauca* shade. Large caterpillars, mainly of the final instar, dropped from the shade trees on the cacao plants or left their foodplants and moved to the young cacao trees. For this reason, investigations were made on this moth species, which ordinarily can be considered as an incidental cacao pest of minor importance. In this paper details concerning the morphology and the life history of the moth will be given.

Two and a half centuries ago, MERIAN (1726) pictured several of the caterpillar instars, the pupa and both moth sexes on an unidentified papilionaceous tree.

### MORPHOLOGY

**Egg.** The pale cream-coloured and oval-shaped egg has a largest diameter of 2.03—2.08 mm.

**Larvae.** Five larval instars can be distinguished, having the following head-widths in millimetres: 1.2 (I), 1.6—1.9 (II), 2.4—2.8 (III), 3.4—4.7 (IV), and 6.0—7.1 (V).

**Larva I.** The young larva has a length and width of about 4 mm and 1.2 mm, respectively; for the full-grown larva these dimensions are 15 mm and 1.5 mm. The head is shiny, light brown; the pronotum and the dorsal part of the 10th abdominal segment are grey-brownish. The primary body colour is yellow. Dorsally and laterally, the anterior margin of each of the first eighth abdominal segments is bordered by a grey-blackish band; such a band can also be observed on the meso- and metathorax. Dorsally, the meso- and metathorax are ornamented with a pair of long slender fleshy projections which are blackish, the pair on the metathorax being the longest (about 1.7 mm) while on each of the segments 8 and 9 a similar but smaller projection is present in the median. All projections bear two black spinulated setae at their tips. Rows of setae of this type are also present on the body, e.g. on the blackish transverse bands. The anterior margin of the pronotum, at both sides of the median, shows 2 pairs of setae, each pair inserted on a common blackish base. Laterally, on the meso- and metathorax a very small tubercle is present, bearing a pair of setae. Ventrally, the body is somewhat grey-greenish brown, as the body contents are visible through the derm.

**Larva II.** Dorsally and laterally the body is yellow with a black to velvety-black transverse band along the anterior margin of the metathorax and the ab-

<sup>1)</sup> Present address: Laboratory of Entomology, Agricultural University, Wageningen, The Netherlands.

<sup>2)</sup> Fam. Saturniidae; determination by W. D. FIELD, U.S.D.A.



dominal segments 1—9; at the mesothorax a similar but often less distinct band is present. Dorsally, segment 10 has 2 short black transverse lines, the first one being curved upward.

The meso- and metathorax are each ornamented with one pair of long slender black coloured projections which bear very short setae. Spinulated setae at their tips, such as could be distinguished on larva I, are absent. These meso- and metathoracic projections attain a length of about 2.5—3 mm and 3—4.5 mm respectively. Dorsally, in the median and in the middle of segment 8 a slender fleshy projection about 1.6 mm in length is present; segment 9 bears at the corresponding place a similar projection with a length of about 0.8 mm. When full-grown the larva attains a length of about 2 cm.

*Larva III.* The head is chestnut-brown; the shiny orange-brown pronotum has 4 small black tubercles on its anterior margin. The pair of long black slender projections on the mesothorax attains a length of about 5—6 mm; the metathoracic pair has a length of 8—9 mm. The dorsal projections in the median of the segments 8 and 9 reach a length of about 4 mm and 2 mm, respectively. The anterior part of the 10th abdominal segment shows a small curved black transverse band; behind it a small grey-dark zone is present. The abdominal legs are orange to rust-coloured. The full-grown larva has a length of about 3—3.5 cm.

*Larva IV.* The fleshy body, that may reach a length of 6—6.5 cm when full-grown, has a dull orange-rusty colour. Legs and stigmata are black. The pair of strong black body projections on the meso- and metathorax have a length varying from 5—11 mm and from 7—13 mm, respectively. The black projection on abdominal segments 8 and 9 attains a length of 3—6 mm and 2—3 mm. A black spiracle is present on the prothorax and each of the first eight abdominal segments.

*Larva V.* All black body projections that ornamented the preceding larval instars are missing; at the meso- and metathorax only a pair of small dark vestigial tubercles may mark their former places of insertion. The dull orange-rusty coloured larva is very fleshy and soft-bodied. When full-grown it reaches a length of about 10—11 cm and a width of 1.6 cm. The shiny head is chestnutbrown; the pronotum, the 10th segment dorsally and the somewhat triangular shaped zone at the outer lateral side of the legs on this segment, are light brown in colour. The large spiracles and the thoracic legs are black.

*Pupa.* In comparison with the large full-grown larva V, the dark brown pupa is rather small, having a length and width of 3.8—4.5 cm and 1.4—1.8 cm. Laterally, at the basal part of the forewing sheath a small thorn-like projection is present; in the head region a similar pair of these projections is situated between the eyes.

*Adult.* The female moth has a wing span varying from 12.5—16 cm. The main colour of body and wings is brown. The non-ciliated antennae, the greater part of the tarsi and 6 spiracle spots on the abdomen are yellow. The wing pattern is composed mainly of brown zones of varying intensities. PREISS (1888) pictures the female moth.

The male moth (see fig. 1), with its brown body and wings, has a wing span of 10—14 cm. The ciliated antennae, the greater part of the tarsi as well as 6 abdominal spiracle spots are yellow. The wing pattern, although less distinct, is



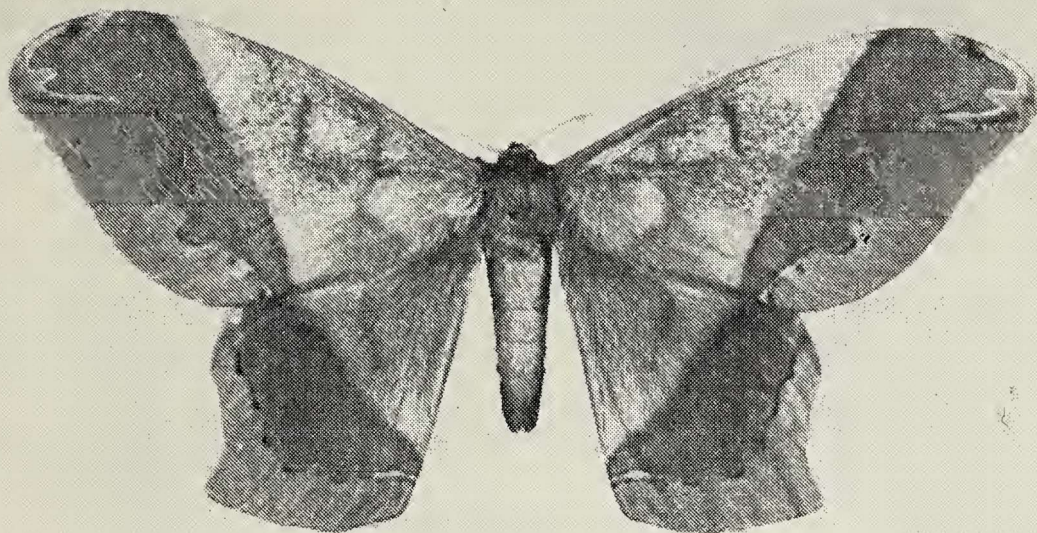


Fig. 1. *Arsenura armida erythrinae* (F.), male moth,  $\frac{2}{3} \times$  natural size.

similar to that of the female moth. The lower outer tip of the hind wing extends beyond the general outline of the wing. The rather slender abdomen tapers at the end.

#### LIFE HISTORY

The moths are active only during darkness, during which time egg-laying also takes place. The eggs are probably deposited in masses on the lower sides of the leaves of *Erythrina glauca*. In captivity female moths deposit their eggs in clusters on any substratum. In dissecting female moths large numbers of well-developed eggs have regularly been counted with a maximum number of 252. Hatching occurs after 11—12 days<sup>1</sup>).

Larvae I exhibit a moderately gregarious habit. Several caterpillars may live on the lower side of a leaf where as a rule they start feeding on the leaf margin. During the last days of this first larval stage, rather large leaf parts have already been eaten away between the veins, sometimes even including the thin soft veins.

As to the developmental duration of the 5 larval instars, the following data in days can be noted: 6 (I), 6 (II), 5 (III), 7 (IV) and 12—13 (V).

The feeding activities become very noticeable during the two last stages, when the large fleshy caterpillars can easily be detected as they are feeding or resting solitarily, dispersed over the attacked tree. When disturbed, the caterpillar holds its body motionless for a period; if strongly irritated a green mucous liquid is vomited. The mature caterpillars leave the trees and crawl or drop to the ground where they penetrate into the soil, making an earthen cell at a depth varying from 5—10 cm without the use of any silk to consolidate the walls. During the prepupal

<sup>1</sup>) Data concerning the developmental duration have been based mainly on observations in the laboratory during January and March-May 1955.



period the larva shortens to a length of about 5 cm, and after 4 days pupation takes place. Normally, the first moths emerge after 34—45 days but longer pupal durations have been noticed.

Moths from caterpillars that pupated at the end of January appeared for the most part during the first half of March. However, three moths from pupae of January 30 emerged on June 1st; pupae with this retardation of development have a diapause. MERIAN (1726) mentions a pupal duration lasting from April 14 to June 12, 1700.

When we reckon with a pupal period of 34 days, the shortest complete developmental duration from egg to moth amounts to 85 days. This means that 4 moth generations can be expected as a yearly maximum, since egg-laying starts soon after the emergence of the moths.



Fig. 2. Number of *A. armida erythrinae* moths, collected on lamp light in the Botanical Garden during June 1955 — June 1956, computed as mean numbers for periods of six days.

Figure 2 shows a graph of the number of moths (expressed as mean numbers for periods of six days) which have been collected on lamp light in the Botanical Garden of Paramaribo from June 1955 until June 1956. Two important flight periods can be noticed, viz. a) at the end of November and the beginning of December, b) during the first half of March. There is a smaller one at the end of May and the beginning of June, while a period of maximum moth activity for the months of August, September and October is less distinct. Periods during which no moths have been observed are rather scarce.

Moths that hover around bulbs during darkness often fall to the ground during their clumsy flight and have great difficulties in flying off again. During their attempts to rise they are often caught and swallowed by toads (*Bufo* spp. ?), that squat on the ground, waiting for prey.

#### Literature

- MERIAN, M. S., 1726, De Generatione et Metamorphosibus Insectorum Surinamensium, Pl. XI.  
 PREISS, P., 1888, Abbildungen hervorragender Nachtschmetterlinge aus dem Indo-Australischen und Südamerikanischen Faunengebiet, Pl. XII, 1.